CLAIMS

What is claimed is:

1. A method of determining a Young's modulus of a cement specimen, the method which comprises the steps of:

(a) inserting cement into a cement mold inside a pressure vessel;

(b) increasing the pressure and temperature within the vessel;

(c) allowing the specimen to cure to form the cement specimen;

(d) applying a measured axial stress and axial strain to the specimen; and

(e) determining a ratio of axial stress to axial strain in the specimen wherein the ratio is the Young's modulus of the specimen.

2. The method of Claim 1 which further comprises the steps of measuring the deflection of the specimen during Step (d).

3. The method of Claim 1 wherein the pressure vessel is at a pressure greater than atmospheric after Step (b).

4. The method of Claim 1 wherein the pressure vessel is at a temperature from a range of about 32°F to about 500°F after Step (b).

5. The method of Claim 1, which further comprises Step of using a data acquisition unit to accumulate data during Step (d).

6. A method of determining Young's moduluses for a plurality of cement specimens, the method which comprises using the Method of Claim 1 on each specimen.

7. The method of Claim 2, wherein the deflection is measure by at least one precision linear transducer.

8. A tester capable of determining Young's modulus for a cement specimen comprising:

a pressure chamber;

at least one mold body disposed in the pressure chamber, wherein the mold comprises:

a stationary portion of the mold body;

a pulled portion of the mold body;

a follower attached to the pulled portion of the mold body capable of imparting axial stress and axial strain on the specimen;

a ram capable of producing a load at a predetermined rate that is transferred to the follower;

a load cell capable of measuring axial stress on the specimen;

a linear displacement transducer capable of measuring axial strain on the specimen;

a least one data acquisition unit capable of recording the axial stress and axial strain on the specimen.

9. The tester of Claim 8 wherein the mold body further comprises a floating section.

10. The tester of Claim 8 further comprising a cam and a piston, wherein the piston extends into the pressure chamber.

11. The tester of Claim 8 further comprising at least one linear transducer.

12. The tester of Claim 8 further comprising at least one thermocouple.

13. The tester of Claim 8 further comprising at least one pressure transducer.

14. A processor capable of calculating Young's modulii for a plurality of cement specimens using the tester of Claim 8, the tester comprising:

a plurality of mold bodies equal to the number of specimens disposed in the at least one pressure chamber; and

a follower attached to each pulled portion of each mold body capable of imparting axial stress and strain on the specimen.

15. The multitester of Claim 14 wherein the load cell imparts a load on each follower in a sequential order.

16. A method of determining Young's modulus in a cement specimen, which comprises the Steps of:

(a) determining axial stress in the specimen;

(b) determining axial strain in the specimen;

(c) determining the ratio of axial stress to axial strain in the specimen to find the Young's Modulus;

wherein Step (a) does not include determining axial stress by compressing the specimen.

17. The method of Claim 16, the method which comprises pressurizing the specimen prior to Step (a).

18. The method of Claim 16, wherein Step (a) measures a tensional stress.

19. A method of determining Young's moduluses for a plurality of cement specimens, which comprises using the method of Claim 16 for each specimen wherein each specimen is contained in a single pressure vessel.